

High Performance Computing Software

JPL Internal Seminar Series



Application-Based Fault Tolerance for Spaceborne Applications

Dr. Daniel S. Katz

Thursday, October 31, 2002

12:00 noon – 1:00 p.m.

Building 126, Room 225

This talk will go through a selective history of the Remote Exploration and Experimentation (REE) project. REE was a NASA Project that worked towards enabling new classes of science missions by dramatically increasing the amount of computing that could be flown on a spacecraft. This was to be done by using commodity-off-the-shelf (COTS) components in place of the customized radiation-hardened processors that are generally used today. The largest issue with using COTS components in space is that they are susceptible to errors due to the natural radiation environment. This talk will focus on how these errors may be detected and corrected both within and without scientific data processing applications that were designed to take advantage of the large amounts of computing REE was promising. The primary internal error detection/correction mechanism was algorithm-based fault tolerance (ABFT.) A number of ABFT routines were developed, and will be discussed.